## Remarks

By way of the proposed amendments, the various objections to the drawings, disclosure and claims have been addressed as requested by the Examiner, except for the objection stated as "in figs. 2, 6A, the previously indicated descriptive wording still needs to be described in the specification." The Examiner is requested to explain further what additional description the Examiner deems necessary, or upon reconsideration to withdraw the objection as the disclosure is believed to contain a full and adequate description of applicants' invention.

On the merits, the Examiner appears to agree that the prior art references do not disclose or suggest providing a duplexer dielectric filter with a higher frequency band in a reception area than in a transmission area by providing an open area free from the conductive layer on the side surface of a dielectric block within only the reception area. However, the Examiner states that because of the 'at least a part' recitation, the claim language would not necessarily limit such "open area" just to the reception area. To remove the basis for this contention and thereby render the art rejection moot, the herewith proposed amendments delete the language "at least a part" from the claims. In addition, the term "corresponding to" is being replaced by "within" for further clarification.

Entry of the proposed amendments is respectfully requested as the same remove any issue with respect to the patentability of the claims. It is noted the amendments were not previously made as the Examiner's expansive interpretation of the noted claim language was not previously recognized.

In view of the foregoing, this application is submitted as being in condition for allowance and an early action to that effect is earnestly solicited..

Respectfully submitted,

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**CERTIFICATE OF MAILING (37 CFR 1.8a)**

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, United States Patent and Trademark Office, Washington, D.C. 20231.

Date: 9-17-02

Don W. Bulson

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## A. Clean Version of Replacement Paragraph/Section/Claim with Instructions for Entry

Please amend the application as follows:

In the Drawings:

Attached for approval by the Examiner is a print showing proposed drawing changes in Figs. 4A and 4B.

In the Specification:

*Replace the paragraphs added to replace the paragraph on page 17 at lines 4-24 with the following paragraphs:*

As described above, the shape of the open area 125 in the duplexer dielectric filter of this invention is not limited. In the primary embodiment of Fig. 3, the open area 125 is integrated with the open areas of both the reception terminal 112b and the antenna terminal 112c. However, the open area according to the present invention can be changed to various embodiments as shown in Figs. 4A and 4B.

Referring to Fig. 4A, the dielectric block 201 has an upper surface 203, a lower surface (not shown), and a side surface 205. A series of resonating holes 207 are formed in the dielectric block 201. A conductive material is coated on at least a part of the side surface 205 between the upper surface 203 and the lower surface, thus forming a ground electrode. The resonating holes 207 are also coated with a conductive material on at least a part of their internal surfaces, thereby forming resonators. The upper surface 203 is provided with an open area free from such a conductive material.

At least one conductive pattern 209 is formed on the upper surface 203 of the dielectric block 201 at a position around each of the resonating holes 207 to be connected to the conductive layers on the internal surfaces of the resonating holes 207. The upper and side surfaces 203 and 205 of the dielectric block 201 are provided with transmission and reception terminals and an antenna terminal 212c 212a and 212b. The transmission terminal 212a, the reception terminal 212b and the antenna terminal 212c are insulated from the conductive material disposed on the side surface 205 of the dielectric block by open areas 214a, 214b and 214c, respectively. While three resonating holes 207, formed

in the dielectric block 201 at the left-hand side of the antenna terminal 212c, are included within the transmission area 210, another three resonating holes 207 in the dielectric block 201 at the right-hand side of the antenna terminal 212c, are included within the reception area 220.

The duplexer dielectric filter, as shown Fig. 4A, includes the open area 225 disposed on the side surface at the position corresponding to the reception area 220 between the reception terminal 212b and the antenna terminal 212c, this being similar to the first embodiment of Fig. 3, but the open area 225 is isolated from the open areas of both the reception terminal 212b and the antenna terminal 212c.

The duplexer dielectric filter according to the third embodiment of the present invention, shown in Fig 4B, includes a plurality of the open areas 325a, 325b, 325c.

Referring to Fig. 4B, similar to the duplexer dielectric filter of Fig 4A, the duplexer dielectric filter comprises the dielectric block 301 having an upper surface 303, a lower surface (not shown), and a side surface 305. A series of resonating holes 307 are formed in the dielectric block 301. The resonating holes 307 are coated with a conductive material on at least a part of their internal surfaces to form resonators. At least one conductive pattern 309 is formed on the upper surface 303 at a position around each of the resonating holes 307. The transmission and the reception terminals and an antenna terminal 312c, 312a and 312b. are disposed on upper and side surfaces 303 and 305 of the dielectric block 301, and are insulated from the conductive material disposed on the side surface 305 of the dielectric block by open areas 314a, 314b and 314c, respectively. While the three resonating holes 307, formed in the dielectric block 301 at the left-hand side of the antenna terminal 312c, are included within the transmission area 310, another three resonating holes 307 at the right-hand side of the antenna terminal 312c, are included within the reception are 320.

The duplexer dielectric filter also comprises a number of open areas (325a, 325b, 325c) at positions corresponding to the conductive patterns 309 formed on the upper surface 303 of the dielectric block 301 , which are isolated from each other as shown in Fig. 4B.

In the second and third embodiments, the open area 225 is not limited in its shape, but may be somewhat freely altered in shape while being spaced apart from the

conductive patterns 209 by a desired distance. It is thus possible to form a desired loading capacitance. Particularly in the third embodiment of Fig. 4B, the desired loading capacitance may be more easily formed by making the sizes of the open areas (325a, 325b, 325c), corresponding to the conductive patterns 309, different from each other.

*Rewrite the paragraph spanning pages 17 and 18 as follows:*

Fig. 6A is a perspective view showing the construction of a duplexer dielectric filter in accordance with the fourth embodiment of the present invention. Fig. 6B is an equivalent circuit diagram of the duplexer dielectric filter of Fig. 6A. In the fourth embodiment, the general shape of the duplexer dielectric filter remains the same as that described for the primary embodiment of Fig. 3, but the structure of the open area 325 is altered (see Fig. 6A). Referring to Fig 6A, the diplexer dielectric filter according to the fourth embodiment comprises the dielectric block 401 having an upper surface 403, a lower surface, and a side surface 405. A series of resonating holes 407 are formed in the dielectric block 401. The resonating holes 407 are coated with a conductive material on at least a part of their internal surfaces to form resonators. At least one conductive pattern 409 is formed on the upper surface 403 at a position around each of the resonating holes 407. The transmission and the reception terminals and an antenna terminal 412c, 412a and 412b are disposed on upper and side surfaces 403 and 405 of the dielectric block 401, and are insulated from the conductive material disposed on the side surface 405 of the dielectric block by open areas 414a, 414b and 414c, respectively.

In the Claims:

1. (Twice Amended) A duplexer dielectric filter, comprising:

a dielectric block having an upper surface, a lower surface, and a side surface, with a conductive material coated on at least a part of the lower and side surfaces;

a reception area for filtering signals received by the filter, said reception area including a plurality of resonators each of which has a first resonating hole, said first resonating hole completely extending from the upper surface to the lower surface of said

dielectric block and being at least partially coated with a conductive material on the internal surface thereof;

a transmission area for filtering signals to be transmitted, said transmission area including a plurality of resonators each of which has a second resonating hole, said second resonating hole completely extending from the upper surface to the lower surface of said dielectric block and being at least partially coated with a conductive material on the internal surface thereof;

reception and transmission terminals for accomplishing signal reception and transmission operation, said reception and transmission terminals respectively comprising an electrode area insulated from the conductive material coated on the side surface of the dielectric block;

an antenna terminal arranged between said first and second filtering areas and comprising an electrode area insulated from the conductive material coated on the side surface of the dielectric block; and

a first open area disposed on said side surface of the dielectric block at a position within the reception area while being free from a conductive material, said first open area controlling both a coupling capacitance and a loading capacitance of at least one of the resonators within the reception area, which is adjacent thereto.

12. (Twice Amended) A duplexer dielectric filter, comprising:

a dielectric block having an upper surface, a lower surface, and a side surface, with a conductive material coated on at least a part of the lower and side surfaces;

a reception area for filtering a received signal, said reception area comprising a resonator including a first resonating hole, said first resonating hole completely extending from the upper surface to the lower surface of said dielectric block while being at least partially coated with a conductive material on the internal surface thereof;

a transmission area for filtering a signal to be transmitted, said transmission area comprising a resonator including a second resonating hole, said second resonating hole completely extending from the upper surface to the lower surface of said dielectric

block while being at least partially coated with a conductive material on the internal surface thereof;

a transmission terminal for accomplishing a signal transmission operation, said transmission terminal comprising an electrode area formed on the upper and side surfaces of the dielectric block at a position corresponding to the transmission area while being insulated from the conductive material coated on the side surface of the dielectric block;

a reception terminal for accomplishing a signal reception operation, said reception terminal comprising an electrode area formed on the upper and side surfaces of the dielectric block at a position corresponding to the reception area while being insulated from the conductive material coated on the side surface of the dielectric block;

an antenna terminal arranged between said reception and transmission areas and comprising an electrode area insulated from the conductive material coated on the side surface of the dielectric block; and

an open area disposed on said side surface of the dielectric block at a position within the reception area while being free from a conductive material, said open area controlling both a coupling capacitance and a loading capacitance of the resonator within the reception area.

## B. Version with Markings to Show Changes Made

Please amend the application as follows:

In the Drawings:

Attached for approval by the Examiner is a print showing proposed drawing changes in Figs. 4A and 4B.

In the Specification:

*Replace the paragraphs added to replace the paragraph on page 17 at lines 4-24 with the following paragraphs:*

As described above, the shape of the open area 125 in the duplexer dielectric filter of this invention is not limited. In the primary embodiment of Fig. 3, the open area 125 is integrated with the open areas of both the reception terminal 112b and the antenna terminal 112c. However, the open area according to the present invention can be changed to various embodiments as shown in Figs. 4A and 4B.

Referring to Fig. 4A, the dielectric block 201 has an upper surface 203, a lower surface (not shown), and a side surface 205. A series of resonating holes 207 are formed in the dielectric block 201. A conductive material is coated on at least a part of the side surface 205 between the upper surface 203 and the lower surface, thus forming a ground electrode. The resonating holes 207 are also coated with a conductive material on at least a part of their internal surfaces, thereby forming resonators. The upper surface 203 is provided with an open area free from such a conductive material.

At least one conductive pattern 209 is formed on the upper surface 203 of the dielectric block 201 at a position around each of the resonating holes 207 to be connected to the conductive layers on the internal surfaces of the resonating holes 207. The upper and side surfaces 203 and 205 of the dielectric block 201 are provided with transmission and reception terminals and an antenna terminal 212c 212a and 212b. The transmission terminal 212a, the reception terminal 212b and the antenna terminal 212c are insulated from the conductive material disposed on the side surface 205 of the dielectric block by open areas 214a, 214b and 214c, respectively. While three resonating holes 207, formed in the dielectric block 201 at the left-hand side of the antenna terminal 212c, are included within the transmission area 210, another three resonating holes 207 in the dielectric block

201 at the right-hand side of the antenna terminal 212c, are included within the reception area 220.

The duplexer dielectric filter, as shown Fig. 4A, includes the open area 225 disposed on the side surface at the position corresponding to the reception area 220 [~~formed~~] between the reception terminal 212b and the antenna terminal 212c, this being similar to the first embodiment of Fig. 3, but the open area 225 is isolated from the open areas of both the reception terminal 212b and the antenna terminal 212c.

The duplexer dielectric filter according to the third embodiment of the present invention, shown in Fig 4B, includes a plurality of the open areas 325a, 325b, 325c.

Referring to Fig. 4B, similar to the duplexer dielectric filter of Fig 4A, the duplexer dielectric filter comprises the dielectric block 301 having an upper surface 303, a lower surface (not shown), and a side surface 305. A series of resonating holes 307 are formed in the dielectric block 301. The resonating holes 307 are coated with a conductive material on at least a part of their internal surfaces to form resonators. At least one conductive pattern 309 is formed on the upper surface 303 at a position around each of the resonating holes 307. The transmission and the reception terminals and an antenna terminal 312c, 312a and 312b. are disposed on upper and side surfaces 303 and 305 of the dielectric block 301, and are insulated from the conductive material disposed on the side surface 305 of the dielectric block by open areas 314a, 314b and 314c, respectively. While the three resonating holes 307, formed in the dielectric block 301 at the left-hand side of the antenna terminal 312c, are included within the transmission area 310, another three resonating holes 307 at the right-hand side of the antenna terminal 312c, are included within the reception are 320.

The duplexer dielectric filter also comprises a number of open areas (325a, 325b, 325c) at positions corresponding to the conductive patterns 309 formed on the upper surface 303 of the dielectric block 301 , which are isolated from each other as shown in Fig. 4B.

In the second and third embodiments, the open area 225 is not limited in its shape, but may be somewhat freely altered in shape while being spaced apart from the conductive patterns 209 by a desired distance. It is thus possible to form a desired loading capacitance. Particularly in the third embodiment of Fig. 4B, the desired loading capacitance may be more easily formed by making the sizes of the open areas (325a, 325b, 325c) [~~325~~], corresponding to the conductive patterns 309, different from each other.

*Rewrite the replacement paragraph spanning pages 17 and 18 as follows:*

Fig. 6A is a perspective view showing the construction of a duplexer dielectric filter in accordance with the fourth embodiment of the present invention. Fig. 6B is an

equivalent circuit diagram of the duplexer dielectric filter of Fig. 6A. In the fourth embodiment, the general shape of the duplexer dielectric filter remains the same as that described for the primary embodiment of Fig. 3, but the structure of the open area 325 is altered (see Fig. 6A). Referring to Fig 6A, the diplexer dielectric filter according to the fourth embodiment comprises the dielectric block 401 having an upper surface 403, a lower surface, and a side surface 405. A series of resonating holes 407 are formed in the dielectric block 401. The resonating holes 407 are coated with a conductive material on at least a part of their internal surfaces to form resonators. At least one conductive pattern 409 is formed on the upper surface 403 at a position around each of the resonating holes 407. The transmission and the reception terminals and an antenna terminal 412c, 412a and 412b. are disposed on upper and side surfaces 403 and 405 of the dielectric block 401, and are insulated from the conductive material disposed on the side surface 405 of the dielectric block by open areas 414a, 414b and 414c, respectively.

In the Claims:

1. (Twice Amended) A duplexer dielectric filter, comprising:

a dielectric block having an upper surface, a lower surface, and a side surface, with a conductive material coated on at least a part of the lower and side surfaces;

a reception area for filtering signals received by the filter, said reception area including a plurality of resonators each of which has a first resonating hole, said first resonating hole completely extending from the upper surface to the lower surface of said dielectric block and being at least partially coated with a conductive material on the internal surface thereof;

a transmission area for filtering signals to be transmitted, said transmission area including a plurality of resonators each of which has a second resonating hole, said second resonating hole completely extending from the upper surface to the lower surface of said dielectric block and being at least partially coated with a conductive material on the internal surface thereof;

reception and transmission terminals for accomplishing signal reception and transmission operation, said reception and transmission terminals respectively comprising an electrode area insulated from the conductive material coated on the side surface of the dielectric block;

an antenna terminal arranged between said first and second filtering areas and comprising an electrode area insulated from the conductive material coated on the side surface of the dielectric block; and

a first open area disposed on [~~at least a part of~~] said side surface of the dielectric block at a position [corresponding to] within the reception area while being free

from a conductive material, said first open area controlling both a coupling capacitance and a loading capacitance of at least one of the resonators within the reception area, which is adjacent thereto.

12. (Twice Amended) A duplexer dielectric filter, comprising:

a dielectric block having an upper surface, a lower surface, and a side surface, with a conductive material coated on at least a part of the lower and side surfaces;

a reception area for filtering a received signal, said reception area comprising a resonator including a first resonating hole, said first resonating hole completely extending from the upper surface to the lower surface of said dielectric block while being at least partially coated with a conductive material on the internal surface thereof [~~its internal surface~~];

a transmission area for filtering a signal to be transmitted, said transmission area comprising a resonator including a second resonating hole, said second resonating hole completely extending from the upper surface to the lower surface of said dielectric block while being at least partially coated with a conductive material on the internal surface thereof [~~its internal surface~~];

a transmission terminal for accomplishing a signal transmission operation, said transmission terminal comprising an electrode area formed on the upper and side surfaces of the dielectric block at a position corresponding to the transmission area while being insulated from the conductive material coated on the side surface of the dielectric block;

a reception terminal for accomplishing a signal reception operation, said reception terminal comprising an electrode area formed on the upper and side surfaces of the dielectric block at a position corresponding to the reception area while being insulated from the conductive material coated on the side surface of the dielectric block;

an antenna terminal arranged between said reception and transmission areas and comprising an electrode area insulated from the conductive material coated on the side surface of the dielectric block; and

an open area disposed on [~~at least a part of~~] said side surface of the dielectric block at a position [corresponding to] within the reception area while being free from a conductive material, said open area controlling both a coupling capacitance and a loading capacitance of the resonator within the reception area.